CLAIMS

What is claimed is:

1. An antibody that competitively inhibits the immunospecific binding of a human SM5-1 specific monoclonal antibody to a SM5-1 target antigen, wherein the variable region of heavy chain of said human SM5-1 specific monoclonal antibody comprises the amino acid sequence set forth in SEQ ID NO:9 and the variable region of light chain of said human SM5-1 specific monoclonal antibody comprises the amino acid sequence set forth in SEQ ID NO:10.

2. The antibody of claim 1, which is selected from the group consisting of a polyclonal antibody, a monoclonal antibody, a Fab fragment, a Fab' fragment, a $F(ab')_2$ fragment, a Fv fragment, a diabody, a single-chain antibody and a multi-specific antibody formed from antibody fragments.

3. The antibody of claim 1, wherein the variable region of heavy chain of said antibody comprises the amino acid sequences 31-35, 50-66 and 99-108 set forth in SEQ ID NO:9 and the variable region of light chain of said antibody comprises the amino acid sequences 24-40, 56-62 and 95-102 set forth in SEQ ID NO:10.

4. The antibody of claim 3, wherein the variable region of heavy chain of the antibody comprises the amino acid sequence set forth in SEQ ID NO:9.

5. The antibody of claim 3, wherein the variable region of light chain of the antibody comprises the amino acid sequence set forth in SEQ ID NO:10.

6. A human SM5-1 specific monoclonal antibody, wherein the variable region of heavy chain of the human SM5-1 specific monoclonal antibody comprises the amino acid

sequence set forth in SEQ ID NO:9 and the variable region of light chain of the human SM5-1 specific monoclonal antibody comprises the amino acid sequence set forth in SEQ ID NO:10.

7. An antibody that competitively inhibits the immunospecific binding of a SM5-1 specific monoclonal antibody to a SM5-1 target antigen, wherein the variable region of heavy chain of said SM5-1 specific monoclonal antibody comprises the amino acid sequence set forth in SEQ ID NO:1 and the variable region of light chain of said SM5-1 specific monoclonal antibody comprises the amino acid sequence set forth in SEQ ID NO:2.

8. The antibody of claim 7, which is selected from the group consisting of a polyclonal antibody, a monoclonal antibody, a Fab fragment, a Fab' fragment, a $F(ab')_2$ fragment, a Fv fragment, a diabody, a single-chain antibody and a multi-specific antibody formed from antibody fragments.

9. The antibody of claim 7, wherein the variable region of heavy chain of said antibody comprises the amino acid sequences 31-35, 50-66 and 99-108 set forth in SEQ ID NO:1 and the variable region of light chain of said antibody comprises the amino acid sequences 24-40, 56-62 and 95-102 set forth in SEQ ID NO:2.

10. The antibody of claim 9, which is a humanized antibody.

11. The antibody of claim 7, wherein the variable region of heavy chain of the antibody comprises the amino acid sequence set forth in SEQ ID NO:3 and the variable region of light chain of the antibody comprises the amino acid sequence set forth in SEQ ID NO:4.

12. A humanized SM5-1 specific monoclonal antibody, wherein the variable region of heavy chain of the humanized antibody comprises the amino acid sequence set forth in SEQ

ID NO:1 and the variable region of light chain of the humanized antibody comprises the amino acid sequence set forth in SEQ ID NO:2.

13. An isolated nucleic acid comprising a nucleotide sequence encoding the heavy chain and/or the light chain, or a fragment thereof, of the antibody of claim 3.

14. An isolated nucleic acid comprising a nucleotide sequence encoding the heavy chain and/or the light chain, or a fragment thereof, of the human SM5-1 specific monoclonal antibody of claim 6.

15. The nucleic acid of claim 14, which comprises the nucleotide sequence set forth in SEQ ID NO:11 and/or SEQ ID NO:12.

16. An isolated nucleic acid comprising a nucleotide sequence complementary to the nucleotide sequence of claim 13.

17. A vector containing the nucleic acid of claim 13.

18. The vector of claim 17, which further comprises expression modulation sequence operatively linked to the nucleic acid encoding the heavy chain and/or the light chain, or a fragment thereof, of the antibody.

19. A recombinant cell containing the nucleic acid of claim 13.

20. The recombinant cell of claim 19, which is an eukaryote cell.

21. The recombinant cell of claim 19, which is a CHO cell.

22. An isolated nucleic acid comprising a nucleotide sequence encoding the heavy chain and/or the light chain, or a fragment thereof, of the antibody of claim 9.

23. An isolated nucleic acid comprising a nucleotide sequence encoding the heavy chain and/or the light chain, or a fragment thereof, of the humanized antibody of claim 12.

24. The nucleic acid of claim 23, which comprises the nucleotide sequence set forth in SEQ ID NO:5 and/or SEQ ID NO:6.

25. An isolated nucleic acid comprising a nucleotide sequence complementary to the nucleotide sequence of claim 22.

26. A vector containing the nucleic acid of claim 22.

27. The vector of claim 26, which further comprises expression modulation sequence operatively linked to the nucleic acid encoding the heavy chain and/or the light chain, or a fragment thereof, of the antibody.

28. A recombinant cell containing the nucleic acid of claim 22.

29. The recombinant cell of claim 28, which is an eukaryote cell.

30. The recombinant cell of claim 28, which is a CHO cell.

31. A method of producing a antibody, or a fragment thereof, comprising growing a recombinant cell containing the nucleic acid of claim 13 such that the encoded antibody, or a

fragment thereof, is expressed by the cell, wherein the antibody is a human antibody; and recovering the expressed the antibody, or a fragment thereof.

32. The method of claim 31, which further comprises isolating and/or purifying the recovered antibody, or a fragment thereof.

33. A method of producing an antibody, or a fragment thereof, comprising growing a recombinant cell containing the nucleic acid of claim 22, such that the encoded antibody, or a fragment thereof, is expressed by the cell, wherein the antibody is a humanized antibody; and recovering the expressed antibody, or a fragment thereof.

34. The method of claim 33, which further comprises isolating and/or purifying the recovered antibody, or a fragment thereof.

35. A pharmaceutical composition comprising an effective amount of the antibody of claim 3 and a pharmaceutically acceptable carrier or excipient, wherein the antibody is a human antibody.

36. A pharmaceutical composition comprising an effective amount of a humanized SM5-1 specific monoclonal antibody and a pharmaceutically acceptable carrier or excipient, wherein the variable region of heavy chain of said humanized SM5-1 specific monoclonal antibody comprises the amino acid sequences 31-35, 50-66 and 99-108 set forth in SEQ ID NO:1 and the variable region of light chain of said SM5-1 specific monoclonal antibody comprises the amino acid sequences 24-40, 56-62 and 95-102 set forth in SEQ ID NO:2.

37. A kit comprising an effective amount of an antibody of claim 3, and an instruction means for administering said antibody, wherein the antibody is a human antibody.

38. A kit comprising an effective amount of a humanized SM5-1 specific monoclonal antibody and an instruction means for administering said antibody, wherein the variable region of heavy chain of said humanized SM5-1 specific monoclonal antibody comprises the amino acid sequences 31-35, 50-66 and 99-108 set forth in SEQ ID NO:1 and the variable region of light chain of said humanized SM5-1 specific monoclonal antibody comprises the amino acid sequences 24-40, 56-62 and 95-102 set forth in SEQ ID NO:2.

39. A method for treating neoplasm in a mammal, which method comprises administering to a mammal to which such treatment is needed or desirable, an effective amount of the antibody of claim 1.

40. The method of claim 39, wherein the mammal is a human.

41. The method of claim 39, wherein the neoplasm is melanoma, breast cancer or hepatocellular carcinoma.

42. The method of claim 39, wherein the antibody is a human SM5-1 specific monoclonal antibody.

43. The method of claim 39, wherein the antibody exerts its anti-neoplasm effect via antibody dependent cell mediated cytotoxicity (ADCC) or complement dependent cell mediated cytotoxicity (CDC).

44. A method for treating neoplasm in a mammal, which method comprises administering to a mammal to which such treatment is needed or desirable, an effective amount of the antibody of claim 7.

45. The method of claim 44, wherein the antibody is a humanized antibody, and wherein the variable region of heavy chain of said humanized antibody comprises the amino acid sequences 31-35, 50-66 and 99-108 set forth in SEQ ID NO:1 and the variable region of light chain of said humanized antibody comprises the amino acid sequences 24-40, 56-62 and 95-102 set forth in SEQ ID NO:2.

46. The method of claim 45, wherein the mammal is a human.

47. The method of claim 45, wherein the neoplasm is melanoma, breast cancer or hepatocellular carcinoma.

48. The method of claim 45, wherein the humanized antibody exerts its anti-neoplasm effect via antibody dependent cell mediated cytotoxicity (ADCC) or complement dependent cell mediated cytotoxicity (CDC).

49. A combination, which combination comprises:

a) an effective amount of the antibody of claim 1; and

b) an effective amount of an anti-neoplasm agent.

50. The combination of claim 49, wherein the anti-neoplasm agent is an agent that treats melanoma, breast cancer or hepatocellular carcinoma.

51. A method for treating neoplasm in a mammal, which method comprises administering to a mammal to which such treatment is needed or desirable, an effective amount of a combination of claim 49.

52. A combination, which combination comprises:

a) an effective amount of the antibody of claim 7; and

b) an effective amount of an anti-neoplasm agent.

53. The combination of claim 52, wherein the antibody is a humanized antibody, and wherein the variable region of heavy chain of said humanized antibody comprises the amino acid sequences 31-35, 50-66 and 99-108 set forth in SEQ ID NO:1 and the variable region of light chain of said humanized antibody comprises the amino acid sequences 24-40, 56-62 and 95-102 set forth in SEQ ID NO:2.

54. The combination of claim 52, wherein the anti-neoplasm agent is an agent that treats melanoma, breast cancer or hepatocellular carcinoma.

55. A method for treating neoplasm in a mammal, which method comprises administering to a mammal to which such treatment is needed or desirable, an effective amount of the combination of claim 52.

56. A method for inducing caspase-10 mediated apoptosis in a cell, which method comprises administering to a cell to which such induction is needed or desirable, an effective amount of the antibody of claim 1.

57. The method of claim 56, wherein the cell is a mammalian cell.

58. The method of claim 56, wherein the cell is contained in a mammal.

59. A method for inducing caspase-10 mediated apoptosis in a cell, which method comprises administering to a cell to which such induction is needed or desirable, an effective amount of the antibody of claim 7.

60. The method of claim 59, wherein the antibody is a humanized antibody, and wherein the variable region of heavy chain of said humanized antibody comprises the amino acid sequences 31-35, 50-66 and 99-108 set forth in SEQ ID NO:1 and the variable region of light chain of said humanized antibody comprises the amino acid sequences 24-40, 56-62 and 95-102 set forth in SEQ ID NO:2.

61. The method of claim 59, wherein the cell is a mammalian cell.

62. The method of claim 59, wherein the cell is contained in a mammal.

63. A conjugate, which conjugate comprises the antibody of claim 1 conjugated to a toxin and/or a radioactive isotope.

64. The conjugate of claim 63, wherein the antibody is a human antibody, and wherein the variable region of heavy chain of said antibody comprises the amino acid sequences 31-35, 50-66 and 99-108 set forth in SEQ ID NO:9 and the variable region of light chain of said antibody comprises the amino acid sequences 24-40, 56-62 and 95-102 set forth in SEQ ID NO:10.

65. A conjugate, which conjugate comprises the antibody of claim 7 conjugated to a toxin and/or a radioactive isotope.

66. The conjugate of claim 65, wherein the antibody is a humanized antibody, and wherein the variable region of heavy chain of said humanized antibody comprises the amino acid sequences 31-35, 50-66 and 99-108 set forth in SEQ ID NO:1 and the variable region of light chain of said humanized antibody comprises the amino acid sequences 24-40, 56-62 and 95-102 set forth in SEQ ID NO:2.

67. A method for assaying for human SM5-1 target antigen in a sample, which method comprises:

a) obtaining a sample from a subject to be tested;

b) contacting said sample with an antibody of claim 1 under suitable conditions to allow binding between said human SM5-1 target antigen, if present in said sample, to said antibody; and

c) assessing binding between said human SM5-1 target antigen, if present in said sample, to said antibody to determine presence, absence and/or amount of said human SM5-1 target antigen in said sample.

68. The method of claim 67, which is used in the prognosis or diagnosis of a neoplasm.

69. The method of claim 68, wherein the neoplasm is melanoma, breast cancer or hepatocellular carcinoma.

70. A method for assaying for human SM5-1 target antigen in a sample, which method comprises:

a) obtaining a sample from a subject to be tested;

b) contacting said sample with the antibody of claim 7 under suitable conditions to allow binding between said human SM5-1 target antigen, if present in said sample, to said antibody; and

c) assessing binding between said human SM5-1 target antigen, if present in said sample, to said antibody to determine presence, absence and/or amount of said human SM5-1 target antigen in said sample.

71. The method of claim 70, which is used in the prognosis or diagnosis of a neoplasm.

72. The method of claim 71, wherein the neoplasm is melanoma, breast cancer or hepatocellular carcinoma.

73. A kit for assaying for human SM5-1 target antigen in a sample, which method comprises:

a) the antibody of claim 1; and

b) means for assessing binding between said human SM5-1 target antigen, if present in said sample, to said antibody to determine presence, absence and/or amount of said human SM5-1 target antigen in said sample.

74. A kit for assaying for human SM5-1 target antigen in a sample, which method comprises:

a) the antibody of claim 7; and

b) means for assessing binding between said human SM5-1 target antigen, if present in said sample, to said antibody to determine presence, absence and/or amount of said human SM5-1 target antigen in said sample.